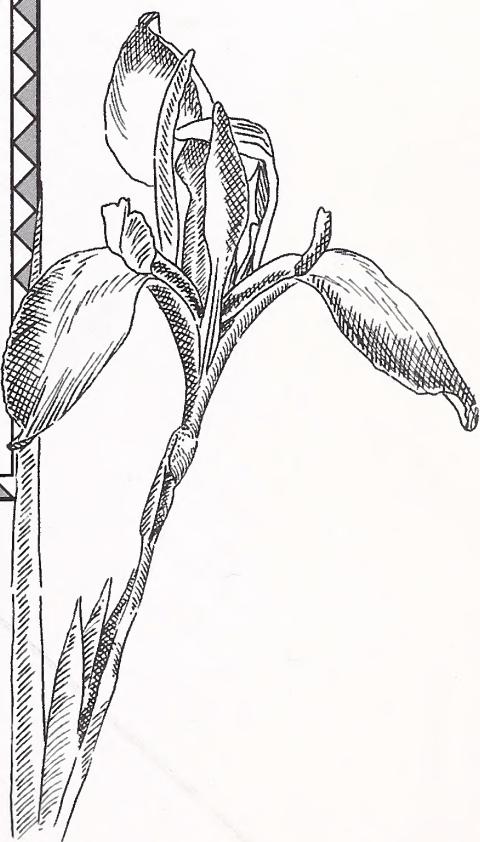


**ECOSYSTEM  
MANAGEMENT  
IN THE BLM: FROM  
CONCEPT  
TO  
COMMITMENT**



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DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT



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# ECOSYSTEM MANAGEMENT IN THE BLM: FROM CONCEPT TO COMMITMENT

BLM/SC/GI-94/005+1736  
January 1994





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*"Every generation receives a natural and cultural legacy from its ancestors and holds it in trust for its descendants. This trust imposes on each generation the obligation to conserve the environment and natural and cultural resources for future generations. The human species faces a grave obligation: conserve this fragile planet Earth and its cultural legacy for future generations. We now recognize that humans have the power to alter the planet irreversibly, on a global scale. Humans must be concerned with the condition of the planet that is passed on to future generations."*

*E. Brown-Weiss  
Environment, 1990*

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## DIRECTOR'S PREFACE

Dear Colleagues:

Secretary of the Interior Bruce Babbitt has spoken of the need to develop a "new American land ethic" that is both ecologically responsible and socially responsive. The Bureau of Land Management (BLM), with stewardship responsibilities for over 270 million acres of public lands and 300 million acres of subsurface mineral estate, can play a substantial role in developing and implementing such a new land ethic.

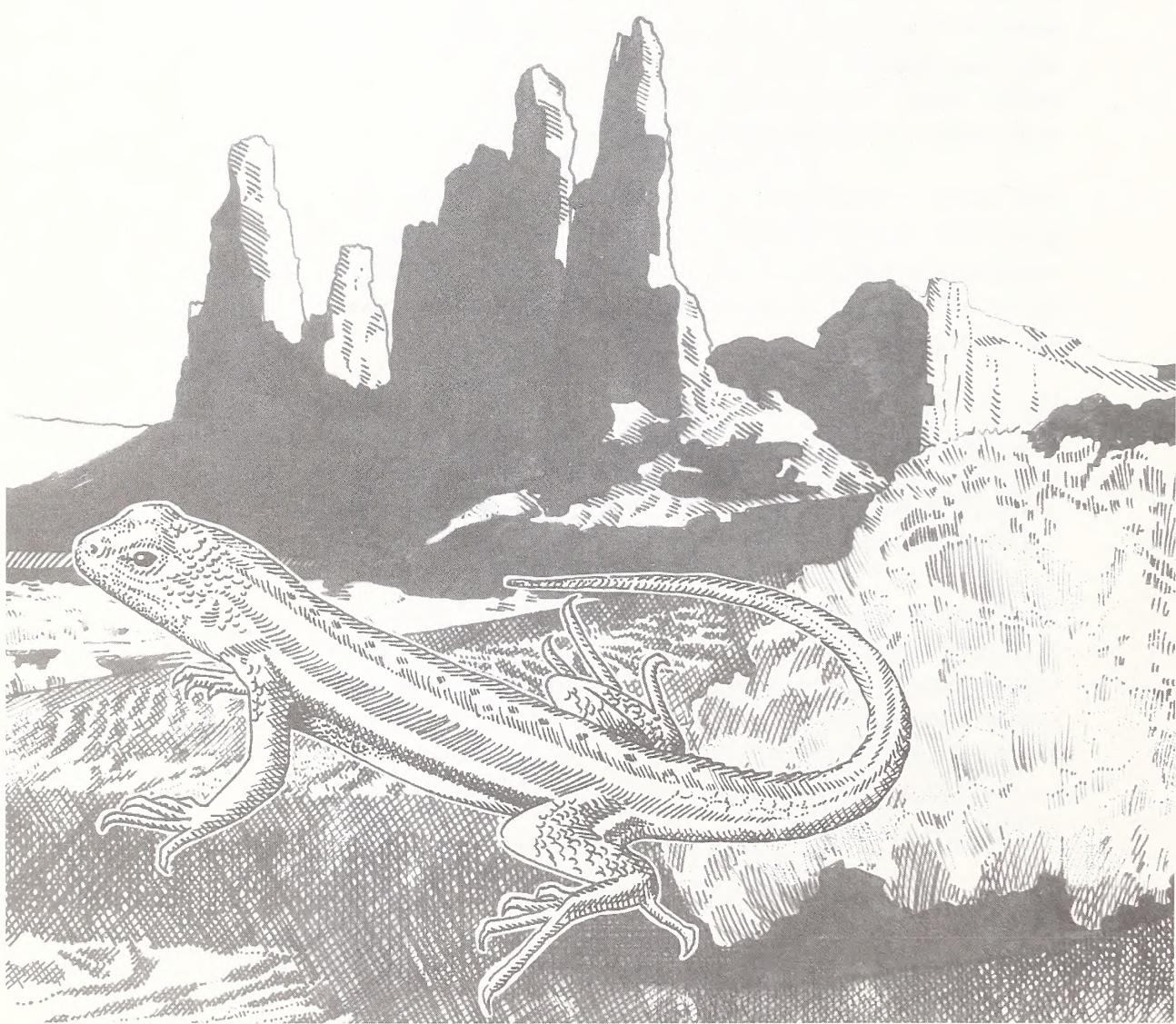
The principles contained within this document, *Ecosystem Management in the BLM: From Concept to Commitment*, provide a new philosophy and a fundamental change in management of the public lands and their resources. As Director of the BLM, I intend to make certain that the principles of ecosystem management frame administration of the public lands. The time has come for us to work with nature for the long-term benefit of society.

The public's expectations and use of Federal lands grow daily. It is the challenge of the BLM to meet these expectations within the limits imposed by the need to conserve biological diversity and safeguard ecological sustainability.

We are not alone in our efforts to develop and implement an ecological approach to management. We are working closely with other State and Federal land management agencies, Congress, user and public interest groups, and private citizens to further develop, refine, and implement the ecosystem approach.

Please send me your thoughts on the principles described in this document. I welcome your input on how to best develop and implement ecosystem management. Implementation of the ecosystem approach will not be a static process. It is imperative that we continue to work with the public every step of the way. I hope you will join us in our efforts to restore and maintain healthy and productive public lands.

Mike Dombeck  
Acting Director



# ECOSYSTEM MANAGEMENT IN THE BLM: FROM CONCEPT TO COMMITMENT

## INTRODUCING A NEW VISION

The U.S. Department of the Interior's Bureau of Land Management (BLM) is committed to safeguarding the ecological sustainability of the public's lands. By conserving the diversity and protecting the integrity of the land, the BLM will ensure that present and future generations continue to derive economic, recreational, social, cultural, and aesthetic benefits from public lands.

## INTRODUCTION

The BLM has adopted the principles of ecosystem management to guide its management of the public's lands and resources. The purpose of this paper is to define those principles, explain why the BLM is adopting an ecosystem approach to management, demonstrate how ecosystem management differs from present management, and discuss the opportunities and challenges brought on by the BLM's new management philosophy.

### What is Ecosystem Management?

*Ecosystem management recognizes that natural systems and processes must be sustained in order to meet the social and economic needs of future generations.*

Ecosystem management is the integration of ecological, economic, and social principles to manage biological and physical systems in a manner that safeguards the long-term ecological sustainability, natural diversity,



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*"The only remaining frontiers in America are found in the spirit of its people. Our charge is to reconcile and nurture that spirit with what stands before us today. We cannot hope to meet the long-term needs of society without first securing the health of the land."*

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*Dr. M. Dombeck  
Acting BLM Director*

and productivity of the landscape. The primary goal of ecosystem management is to conserve, restore, and maintain the ecological integrity, productivity, and biological diversity of public lands. Among other things, sustainable ecosystems provide habitat for

fish and wildlife, clean drinking water for communities, wood fiber, forage, and recreational opportunities.

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*"Every country has three forms of wealth: material, cultural, and biological. The first two we understand well because they are the substance of our everyday lives. The essence of the biodiversity problem is that biological wealth is taken much less seriously. This is a major strategic error, one that will be increasingly regretted as time passes."*

*Edward O. Wilson,  
The Diversity of Life, 1992*

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### **Why is an Ecosystem Approach to Management of the Public Lands Necessary?**

The cumulative effects of past activities on public and private lands have often led to degraded aquatic and riparian systems; less productive rangeland conditions; fragmented plant, animal, and fish habitats; and forest health problems. Human population growth, increased use, fire exclusion, flood control, and other factors also have contributed to degradation of the public lands and caused sig-

nificant declines in the range and numbers of native flora and fauna. Furthermore, the intentional and unintentional introduction of exotic plant, terrestrial, and aquatic species jeopardizes the biological diversity of the public lands. For example, the infestation of exotic, noxious weeds threatens the productivity of the western rangelands and the viability of many native plant communities. About 8 million acres of BLM land are infested by noxious weeds, which spread at about 14 percent per year. In other words, 2,000-3,000 acres of productive BLM lands are lost to noxious weeds per day.

Nonetheless, public lands are the last refuges for many vanishing species. For example, over 191 federally listed threatened and endangered plant and animal species and over 1,100 candidate species occur on BLM lands. BLM lands provide habitat for at least 109 salmon and steelhead stocks that are at risk of extinction.



*Ecosystem management safeguards ecological integrity and provides economic opportunity.*

Communities whose economies depend on public lands are often the most seriously affected by ecological degradation. The declining timber and commercial and recreational fishing industries of the Pacific Northwest, for example, demonstrate the economic

repercussions and social displacement that can accompany ecosystem degradation. Conservation efforts on public lands can make a critical difference to the viability of vulnerable plant and animal species and the stability of local economies. Poor forest and range-land health, degraded riparian areas, and inferior aquatic habitats can threaten species' viability, resource productivity, and ultimately, the overall sustainability of ecological systems.

## **How is Ecosystem Management Different From Current Management?**

Traditionally, resource management strategies in the West have emphasized commodity production and the commercial use of natural resources. Management objectives were often designed to expedite the development, extraction, and/or production of resources on public lands. Other uses and values, such as wildlife and fish habitats; some recreational activities; and cultural, scenic, and aesthetic resources, were often viewed as constraints or mitigation for more intensive uses.

Management strategies that emphasize commodity production tend to separate BLM programs along functional lines. This lack of internal coordination detracts from the agency's ability to develop coherent and integrated management strategies with other government agencies, user groups, private landowners, and other interested parties.

Ecosystem management will assist the BLM in coordinating efforts to maintain the land's health at multiple geographic levels. Ecosystems do not have absolute or permanent boundaries. They change and evolve in response to both human influence and natural events. Because ecological systems do not always correspond to existing administrative boundaries, the BLM will encourage partnerships, share management responsibilities, and when appropriate, establish common management goals with other Federal, State, and private land managers; local communities; and other interested parties.

Ecosystem management will not eliminate the necessity for making difficult choices. The overriding objective of ecosystem management is to ensure the ecological sustainability of the land. Ecological factors impose explicit limits on land use. The BLM will make management decisions with a better informed understanding of the relationship among land management activities, site capability, social and economic demands, and ecological health and sustainability. Resources will be allocated within the

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*"It is unfortunate that we must deal at the level of individual species. This forces us to focus attention on single parts of ecosystems, while ecosystems themselves should be the subjects of our efforts. Endangered species are nonetheless the messengers of change, and we must heed their message."*

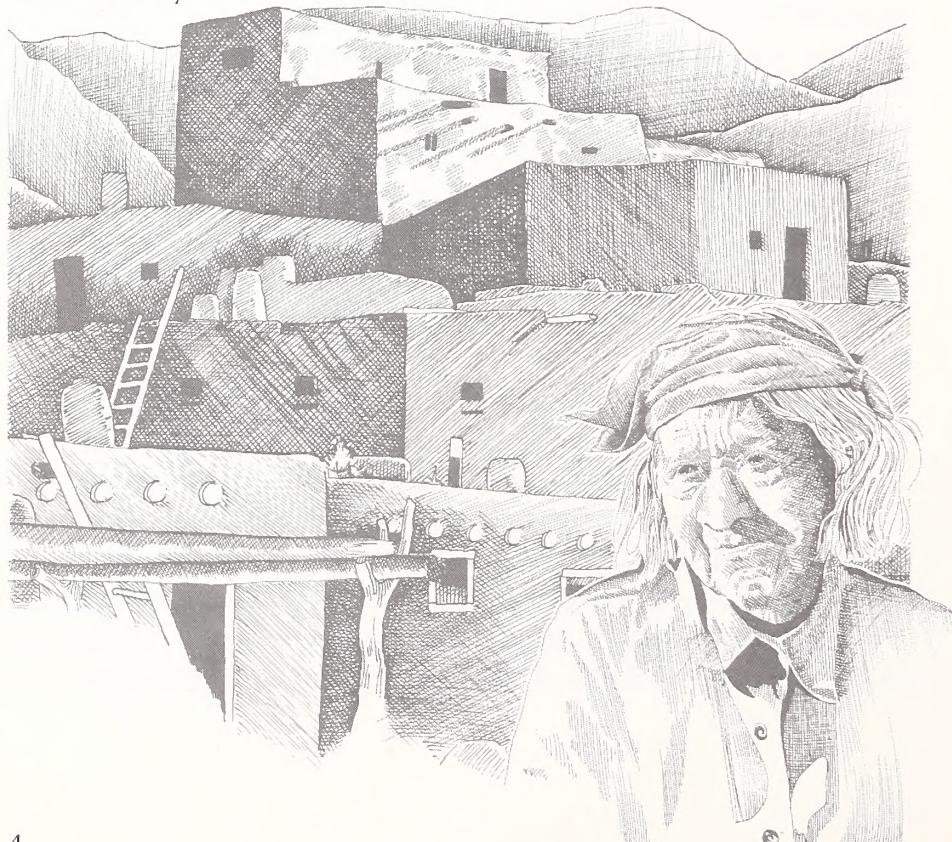
*Stewart L. Udall*  
*Forward to Battle Against Extinction:*  
*Native Fish Management in the*  
*American West, 1991*

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constraints dictated by maintaining long-term ecosystem health. BLM sometimes lacks critical baseline information on the historic and present conditions of the public lands. Obtaining baseline data is a BLM priority that will enable the agency to make better informed decisions about the public lands.

The BLM is responsible for 300 million acres of subsurface mineral estate. The leasing and operations of these lands should be conducted by the same principles that are applied to BLM surface lands. The BLM will participate appropriately in aspects of leasing and operations to ensure that they conform to the principles of ecosystem management.

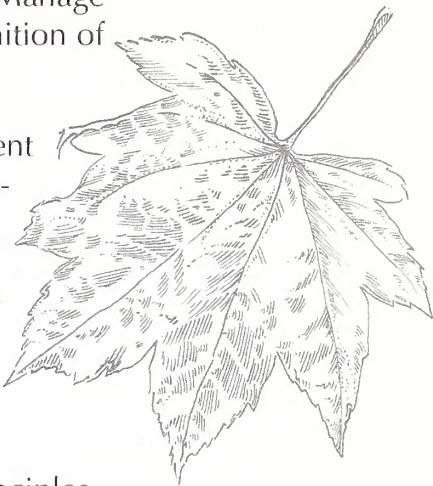
Ecosystem management provides a framework in which scientific information will be used to more objectively evaluate resource trade-off decisions. Successful implementation of ecosystem management principles hinges on the integration of scientific information with resource management and allocation decisions. The BLM will ensure that short-term economic and political objectives are integrated with long-term objectives designed to restore and maintain ecosystem integrity, productivity, and diversity. As new information becomes available, management direction will be modified to ensure that BLM lands maintain ecological sustainability.



## ECOSYSTEM MANAGEMENT PRINCIPLES

The principles described below are consistent with the mission of the BLM as outlined in the Federal Land Policy and Management Act (FLPMA), which includes the following definition of "multiple use" (43 U.S.C. 1702(L)):

"... [H]armonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination that will give the greatest economic return or the greatest unit output."



BLM management actions will be governed by the principles described below:

- *Sustain the productivity and diversity of ecological systems*

The BLM will manage the public lands to sustain ecological processes and functions in order to provide resilience to short-term stress and adaptation to long-term change. We will conserve, maintain, and restore the ecological integrity of the land and provide for human values, products, and services within the limits of ecological sustainability.

- *Gather and use the best available scientific information as the cornerstone for resource allocations and other land management decisions*

The BLM will use scientific information (including biological, physical, economic, and social), research, new technologies, and the results of monitoring to determine appropriate local, landscape, and regional management strategies. Closer working relationships between researchers and managers will be encouraged to better understand the effects of management activities on the land. The BLM will work cooperatively with other Federal and State agencies, researchers, local governments, and universities to prioritize restoration of degraded public lands. We will also work with these groups to develop methodologies and technologies to restore impaired ecosystems.

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*"We cannot afford to drag our feet until a species is at the brink of extinction and then argue about protecting its last small corner of habitat."*

*Bruce Babbitt, 1994*

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- *Involve the public in the planning process and coordinate with other Federal, State, and private landowners*

*"We have not inherited the land from our forefathers, we have borrowed it from our children."*

*Kashmiri Proverb*

Most resource issues require coordination and cooperation among public and private land managers. The BLM will form partnerships and exchange data with Federal, State, and private land managers, researchers, universities, Native American tribes, and interested

publics to resolve multijurisdictional resource issues, such as anadromous fish conservation and restoration, migratory bird habitat protection, and air and water quality. Input from all interested and affected parties will be sought to develop management strategies that provide for social and economic well-being while safeguarding ecosystem health.

Whenever possible, the BLM will integrate management efforts with those of private landholders and assist in conserving and restoring the health and productivity of the land. However, the BLM has no management authority on private lands and will work only with interested landholders. The BLM will not attempt to dictate private land practices.

*"The effort to control the health of the land has not been very successful. It is now generally understood that when soil loses fertility, or washes away faster than it forms, and when water systems exhibit abnormal floods and shortages, the land is sick."*

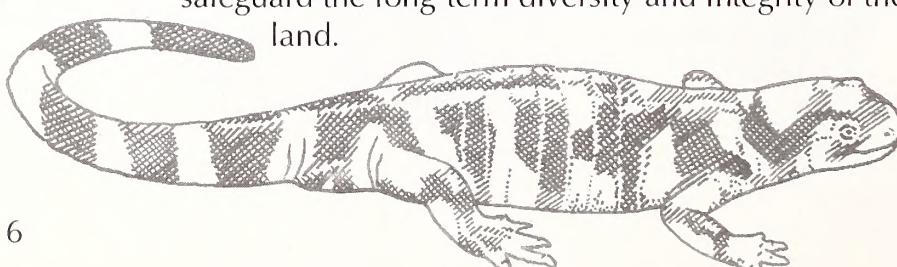
*Aldo Leopold  
Wilderness as a Land Laboratory,  
1941*

- *Determine desired future ecosystem conditions based on historic, ecologic, economic, and social considerations*

The BLM will coordinate across administrative and political boundaries to assist in determining the desired future condition of ecosystems. In order to safeguard sustainable ecosystems, ecological, economic, political, and social factors will be considered to determine appropriate resource uses, cost of uses, products, and services on the public lands.

- *Work to minimize and repair impacts to the land*

Land-disturbing management activities on the public lands such as grazing, mining, timber harvest, right-of-way developments, and some recreation activities will be conducted in a manner that minimizes ecosystem fragmentation and degradation and maintains the ecological health and diversity of the land. All management activities will include rehabilitation provisions that safeguard the long-term diversity and integrity of the land.



- *Adopt an interdisciplinary approach to land management*

Presently, different programs within the BLM are too often functionally isolated by their own specific areas of interest and expertise. In the future, BLM programs that are currently separate will work together to set priorities and objectives to ensure consistency among different program areas. For example, the BLM's range, wildlife and fisheries, forestry, recreation, and minerals disciplines will establish common objectives and management prescriptions for activities within critically important riparian areas. Program advocacy will yield to the common objective of conserving and restoring sustainable ecosystems.

- *Base planning and management on long-term horizons and goals*

The BLM will plan, manage, and monitor over the long term. Sustaining ecosystems requires that sound, long-term ecological objectives are defined before short-term commercial and political objectives are identified. The BLM will develop measurable and quantifiable resource condition objectives whenever possible. Upward trends and patterns in ecosystem health will be used to define resource objectives. Resource objectives will be met if: 1) site-specific and landscape conditions are at a desired condition, or 2) the health of the land is improving.

Local management actions influence resource conditions well beyond adjacent borders. For this reason, the effect of management actions will be considered at the local, regional, and national levels. The BLM has a unique responsibility to protect public resources that are not provided for by economic markets, such as biological diversity and aesthetic, cultural, and some recreational values.

- *Reconnect isolated parts of the landscape*

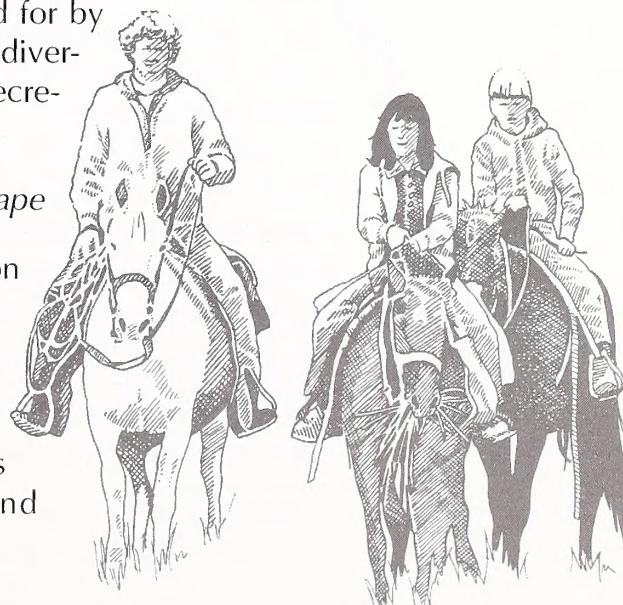
BLM management actions will focus on connecting all parts of the landscape. For example, rivers will be managed in association with floodplains, and management activities in upland habitats will be considered for their effects on riparian areas, surfacewaters, and groundwaters.

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*"...it should not be so hard to mesh the needs of the lands and the waters and the people. They ought to be the same. In the last analysis, they are the same."*

*Charles F. Wilkinson  
Crossing the Next Meridian, 1992*

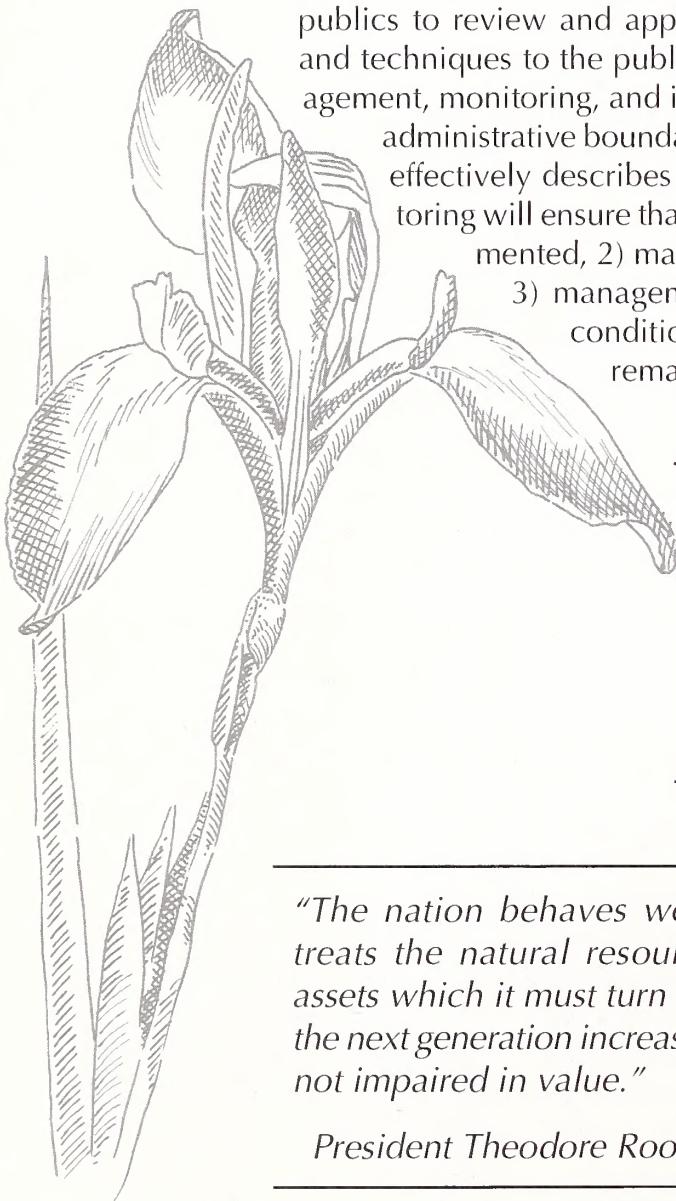
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- *Practice adaptive management*

Monitoring and inventory information will be used to assess the effect of management actions on ecosystem health. The results of monitoring will be integrated into management decisions and management will be adapted as resource conditions warrant. Management prescriptions will adapt to changing ecosystem conditions; consider the management actions of other Federal, State, and private landowners; balance the effects of management on the condition of the land; and attain stated objectives. Monitoring programs will clearly describe baseline resource threshold levels, which, if exceeded, will trigger delay, modification, or cancellation of management activities and/or refinement of management direction.

The BLM will coordinate with other agencies and interested publics to review and apply appropriate monitoring methods and techniques to the public lands. Whenever possible, management, monitoring, and inventory will be coordinated across administrative boundaries and conducted in a manner that effectively describes the health of an ecosystem. Monitoring will ensure that: 1) management direction is implemented, 2) management direction is effective, and 3) management assumptions about ecological conditions and their response to treatments remain valid over time.



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*"When we try to pick out anything by itself, we find it hitched to everything else in the universe."*

*John Muir*  
*My First Summer in the Sierra, 1911*

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*"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value."*

*President Theodore Roosevelt*

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## MOVING TOWARD ECOSYSTEM MANAGEMENT: OPPORTUNITIES IN THE BLM

The BLM is participating in a number of efforts that are consistent with many of the principles of ecosystem management. Several of these are described below.

### California Bioregions

In California, the BLM signed a Memorandum of Understanding with other Federal, State, and County partners to develop a coordinated, statewide biodiversity planning strategy. The effort coordinates the actions of the principal land management agencies under the long-term goal of conserving the rich natural heritage of each major bioregion in California while maintaining economic growth and development.

*"During the past two decades it has become evident that knowledge no longer limits our ability to protect native fishes. Most endangered species can be recovered, if we choose."*

*James E. Deacon &  
W.L. Minckley*

*Western Fishes and the Real World:  
the Enigma of "Endangered Species"  
Revisited, 1991*

### Bring Back the Natives

The BLM, the Forest Service, and the National Fish and Wildlife Foundation are in the third year of a cooperative aquatic species restoration campaign that emphasizes interagency coordination, watershed management, and improved land use practices to conserve and restore aquatic and riparian habitats on Federal lands.

### Forest Conference Activities

On April 2, 1993, President Clinton convened a Forest Conference in Portland, Oregon. The President directed the Federal land management agencies to provide him with a scientifically sound, socially responsive, ecologically credible, and legally responsible plan that would address old growth forest issues, such as the controversy over protecting the northern spotted owl in the Pacific Northwest. A multidisciplinary, interagency team developed a series of forest management alternatives for the President's review. The team's key objective was to develop management prescriptions that would safeguard the viability of native species and allow for the production of a sustainable level of goods and services. Included in the management direction are provisions that prohibit timber harvest in critically important riparian areas until it is proven that riparian management objectives can be met.

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*"The one process now going on that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats."*

*Aldo Leopold  
The Ecological Conscience, 1947*

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## **PACFISH (Pacific Salmon and Steelhead Recovery Strategy)**

The BLM and the Forest Service merged efforts to develop a common strategy to conserve and restore anadromous salmonid habitats on public lands in March 1993. The strategy, known as PACFISH, would conserve and restore Pacific salmon and steelhead habitats and associated watersheds on Federal lands

in the West. PACFISH stresses the integration of sound scientific and research information with on-the-ground management direction. The PACFISH strategy also formed the aquatic and riparian components of the preferred option developed by the Forest Conference.

## **Neotropical Migratory Birds/ Partners in Flight**



Partners in Flight is a coordinated, international effort designed to conserve neotropical migratory bird species and associated habitats. It establishes national, regional, state, and physiographic province working groups that coordinate monitoring, research, and public education efforts on neotropical migratory birds and their habitats. Working groups are comprised of Federal and State agencies and private organizations that work together to integrate management efforts for migratory birds.

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*"The practice of conservation must spring from a conviction of what is ethically and esthetically right, as well as what is economically expedient. A thing is right only when it tends to preserve the integrity, stability, and beauty of the community, and the community includes the soil, waters, fauna, and flora as well as people."*

*Aldo Leopold  
The Ecological Conscience, 1947*

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## MOVING TOWARD ECOSYSTEM MANAGEMENT: CHALLENGES FOR THE BLM

The BLM is faced with numerous legislative, political, regulatory, programmatic, and cultural obstacles that may hinder the successful implementation of ecosystem management. Our ability to resolve these and other issues will directly influence the effectiveness of ecosystem management.

### Management Incentives

Historically, Federal agencies have often been rewarded for achieving targets based on the production of commodities. Other objectives, especially those that were non-consumptive, such as aesthetic and scenic values and some recreation, were sometimes neglected. Since the production of all goods and services is dependent on ecosystem health, managers' overriding objective should be to maintain naturally diverse and sustainable ecological systems. Federal agencies should develop management incentives that are based on the present state and desired future upward trend of resource conditions (with consideration given to the effects of past activities and natural events on the land; i.e., fire, drought, etc.). Managers will be responsible for resource conditions and trends that contribute to/or degrade ecosystem health. The reasons for declining resource trends will be identified and addressed.

Managers will be provided training opportunities designed to facilitate the implementation of ecosystem management. Interdisciplinary training will be provided to BLM employees with an emphasis on developing both cross-cutting and scarce skills in areas such as hydrology, fire ecology, geomorphology, and soils and aquatic ecology.

### Administrative Boundaries

Agency attempts to implement an ecosystem approach to management are complicated by the presence of administrative boundaries that typically do not correspond to ecologically based boundaries. Boundaries for the public lands were primarily delineated to accomplish social and political goals. Ecosystems occur at a variety of scales, and Federal agencies are rarely the sole manag-

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*"The entire U.S. government ought to understand the economic significance of a healthy environment as a kind of infrastructure supporting future productivity. If it is destroyed, many jobs now at risk will be lost."*

Al Gore  
*Earth in the Balance, 1992*

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*"No important change in human conduct is ever accomplished without an internal change in our intellectual emphases, our loyalties, our affections, and our convictions."*

*Aldo Leopold*  
*The Ecological Conscience, 1947*

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The BLM is entering into agreements and partnerships with private and Federal land managers to coordinate planning, adaptive management, and monitoring.

### **The Role of other Agencies, Universities, and Researchers**

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*"The one process now going on that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us."*

*Edward O. Wilson*  
*Biophilia, 1984*

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The National Biological Survey (NBS), Forest Service Research Stations, Environmental Protection Agency (EPA), Agricultural Research Service (ARS), university research programs, and others could assist land management agencies in integrating administrative boundaries with ecologically based boundaries in order to:

- Work with other agencies to evaluate the effects of management activities across administrative boundaries;
- Map the habitats of threatened and endangered species and rare flora and fauna on public lands;
- Identify sustainable commodity production levels within an ecologically based boundary (e.g., timber harvest in a watershed, forage production across a landscape); and
- Implement threatened and endangered species recovery programs.

The researchers would be well-equipped to review and analyze existing and potential landscape analysis techniques (e.g., Geographic Information System (GIS) technology, Environmental Monitoring and Assessment Program (EMAP), Landscape Ecology Modeling and Analysis (LEMA), and GAP Analysis) to utilize their full potential as analytical tools to manage the Federal lands.

## Resource and Data Classification Systems

Coordination among management agencies is impeded by the fact that Federal land management agencies often employ different data standards and resource classification systems. Standardization in the following areas would promote interagency coordination:

- classification of watersheds, rivers, and streams
- classification of standing waters
- classification of wetlands, meadows, and bogs
- classification of soil types and landforms
- classification of vegetation and riparian areas

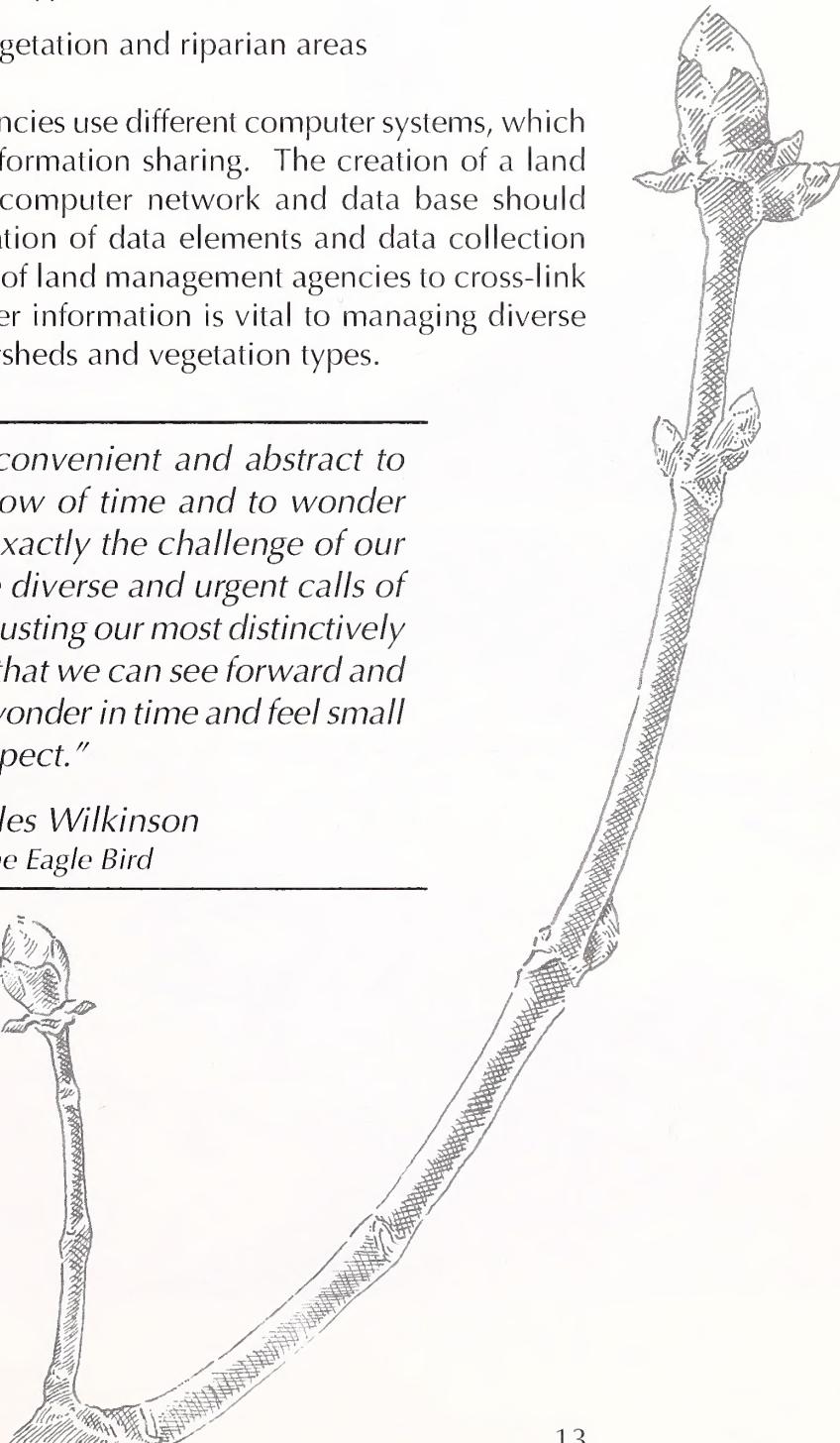
Land management agencies use different computer systems, which further complicates information sharing. The creation of a land management agency computer network and data base should follow the standardization of data elements and data collection processes. The ability of land management agencies to cross-link resource data and other information is vital to managing diverse systems, such as watersheds and vegetation types.

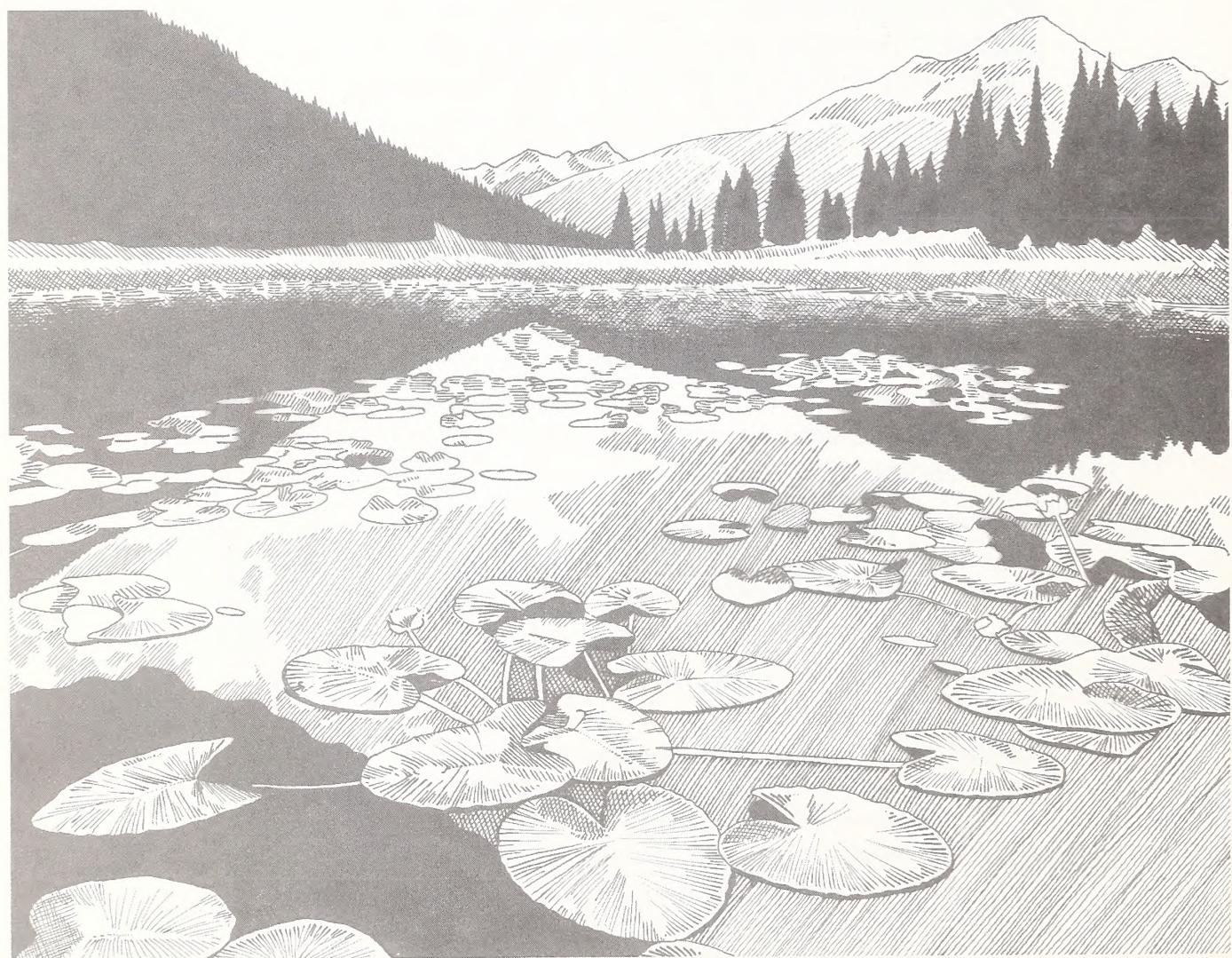
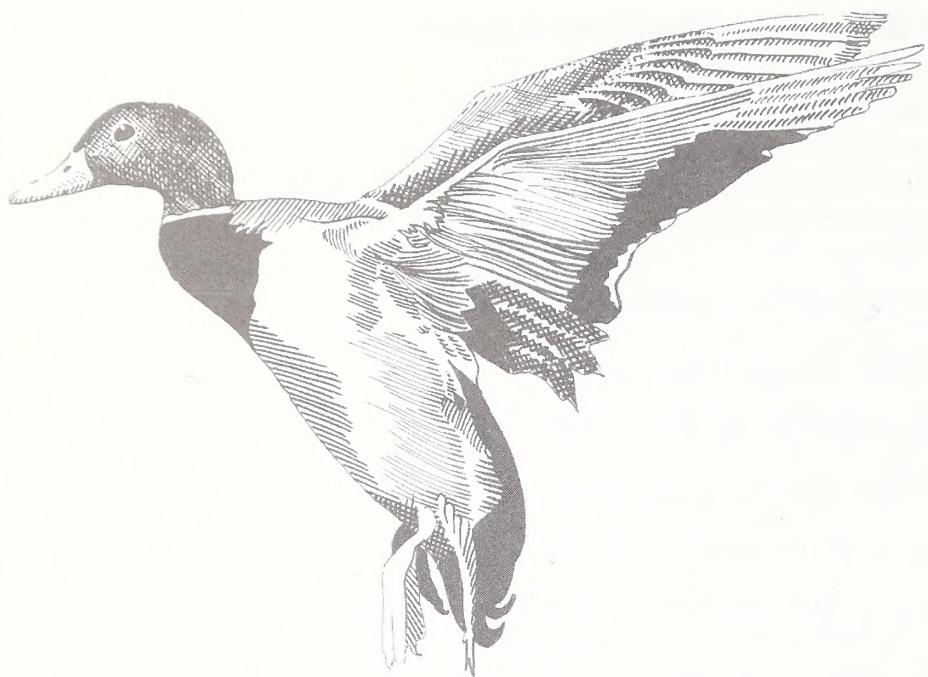
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*"It often seems inconvenient and abstract to worry about the flow of time and to wonder about it. Yet it is exactly the challenge of our people to meet the diverse and urgent calls of a churning era by trusting our most distinctively human qualities—that we can see forward and back, that we can wonder in time and feel small in it and give it respect."*

*Charles Wilkinson  
The Eagle Bird*

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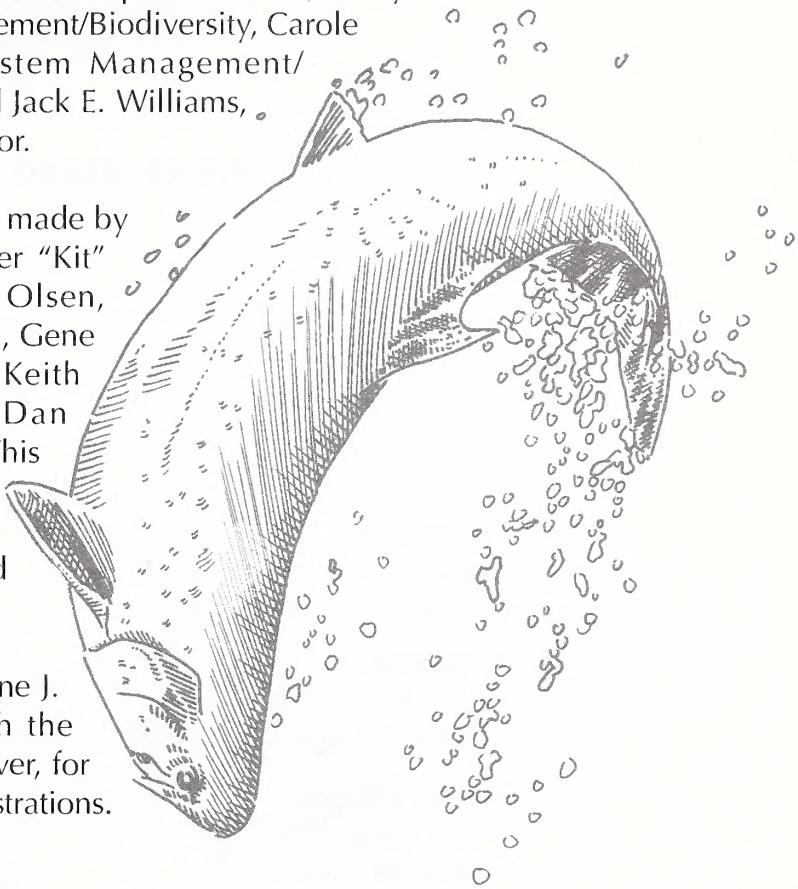


## ACKNOWLEDGMENTS

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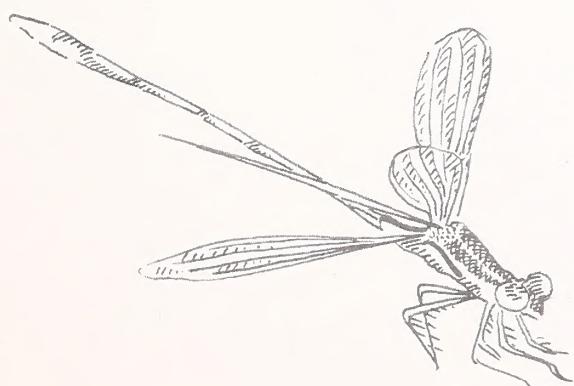


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*"As the one species that dominates the world, we must make space for the rest of creation to play its assigned role on this planet. It can't be 'us vs. them.' Ultimately, we'll all lose. But if we learn to live more lightly on the land, we'll all win."*

*Bruce Babbitt, 1994*

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